

# HAMILTON COUNTY

## Maternal and Infant Health Monthly Surveillance Report

December 2019

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**HAMILTON COUNTY  
PUBLIC HEALTH**

PREVENT. PROMOTE. PROTECT.



  
**cradle cincinnati**

every baby, every day

# INTRODUCTION

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The Maternal and Infant Health Monthly Surveillance Reports are part of work throughout Hamilton County to improve the health of women and infants, and to lower the number of infant deaths. In order to improve the health and safety of infants in Hamilton County, it is important to identify, describe, and track the problems and people at risk. This report shows the current state of infant mortality in Hamilton County.

The data for these reports has been provided by the Ohio Department of Health. The Department specifically disclaims responsibility for any analyses, interpretations or conclusions. Death and birth data in this report were collected from Ohio Public Health Information Warehouse on January 31<sup>th</sup>, 2019.

Surveillance reports for 2019 and prior were generated using two death data sets obtained from ODH. Starting in 2019, surveillance reports were created using a single death data set provided by ODH, thus the old Appendix A was removed.

The Maternal and Infant Health Monthly Surveillance Report will include the following topics:

- Number of infant deaths by month
- Current monthly infant mortality rate
- Current monthly neonatal mortality rate
- Current monthly preterm, very preterm, and <23 weeks gestation birth rate
- Current monthly small for gestational age birth rate
- Percentage of pregnancies spaced <18 months
- Maternal smoking rates
- Number of sleep-related deaths
- Current two-year infant mortality rate moving average

## INFANT MORTALITY SURVEILLANCE

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Public Health surveillance is the ongoing systematic collection, analysis, interpretation and dissemination of data regarding health-related events for use in public health action to decrease sickness and death, and improve health<sup>1</sup>. The Maternal and Infant Health Surveillance System is designed to better understand infant health in Hamilton County, track infant deaths and determine whether the ongoing work in Hamilton County to prevent infant deaths are effective. The charts used within this report are surveillance charts, which are tools to monitor infant health in Hamilton County. Comparisons to the national Healthy People 2020 Goals are made when possible. Healthy People 2020 Goals are a set of nationwide goals that support prevention efforts to create a healthier nation. These goals are released every 10 years from the US Department of Health and Human services. For more information about how to understand the surveillance charts, please read the General Guidelines for Using Surveillances Charts in **Appendix A**.

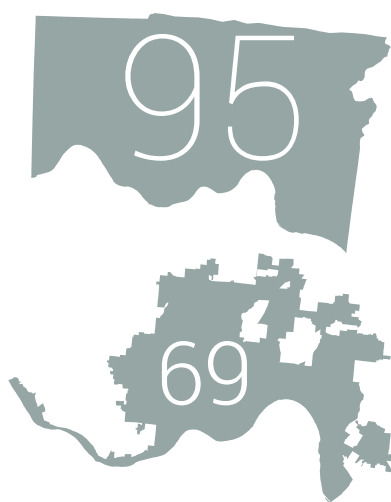
1. Centers for Disease Control and Prevention. *Updated Guidelines for Evaluating Public Health Surveillance Systems: Recommendations from the Guidelines Working Group*, MMWR, July 27,2007, Vol. 50 No. RR-13.

# NUMBER OF INFANT DEATHS

One way to look at infant health is to track the number of infant deaths in Hamilton County per month. Infant deaths are the death of a child before his or her first birthday. In December 2019, there were 7 infant deaths in Hamilton County. Two of the infant deaths that occurred in December 2019 in Hamilton County, occurred among Cincinnati residents. Table 1 displays the provisional number of infant deaths and births for each month in 2018 and 2019.

Table 1. Number of Infant Deaths and Births, Hamilton County, 2018-2019

	2018		2019	
	Infant Deaths	Live Births	Infant Deaths	Live Births
January	10	860	5	863
February	9	797	4	809
March	12	907	2	793
April	8	877	12	843
May	7	894	13	904
June	7	891	10	858
July	9	865	8	912
August	6	981	7	958
September	6	959	10	910
October	7	961	8	941
November	5	893	9	874
December	6	854	7	916
Total	92	10,739	95	10,581



Infant Deaths,  
Hamilton County  
2019 Year-to-date

Infant Deaths,  
Cincinnati  
2019 Year-to-date

# INFANT MORTALITY RATES

7.6 per 1,000  
December 2019 IMR

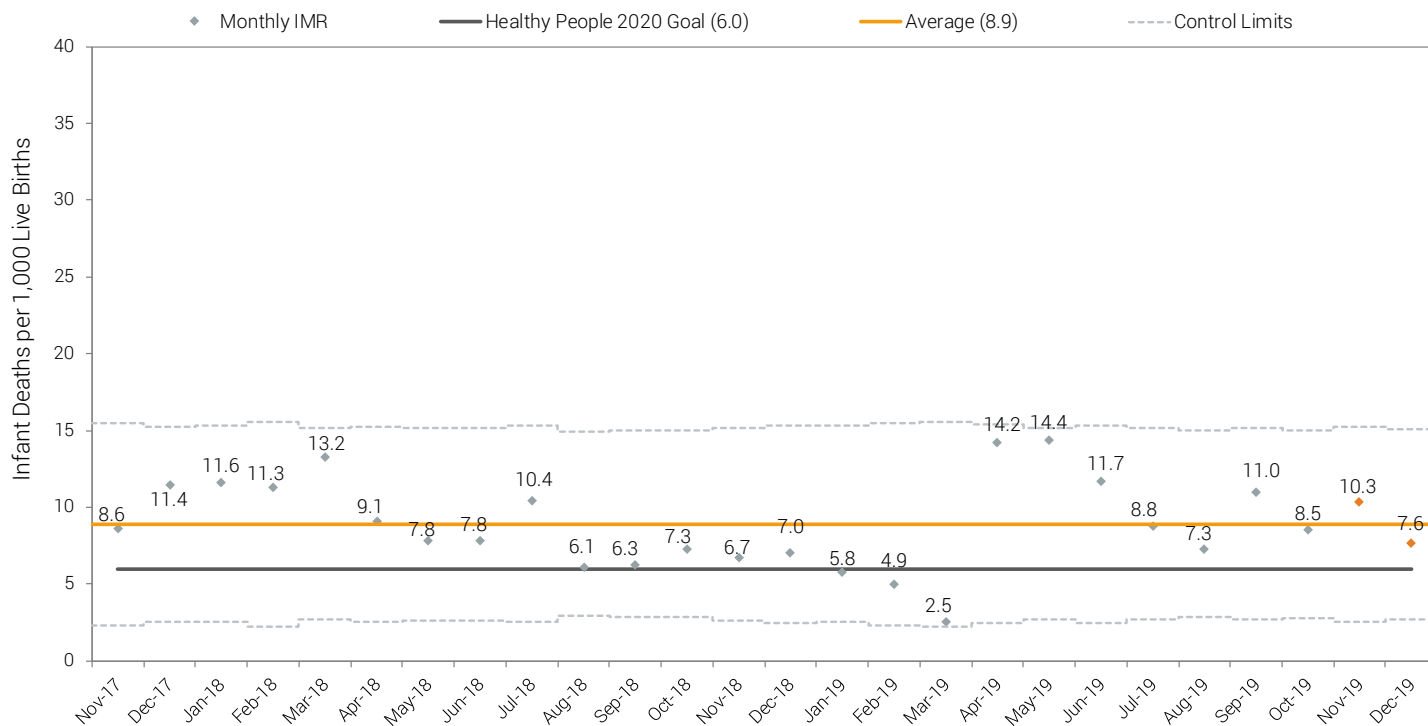
This provisional rate was  
higher than the Healthy  
People 2020 goal (6.0)

Another way to measure infant health is to track the Infant Mortality Rate (IMR) per month. An infant mortality rate is the number of infant deaths for every 1,000 live births. The Neonatal Infant Mortality Rate (NIMR) is a specific IMR for neonates (infants who are younger than 28 days). A neonatal infant mortality rate is the number of neonatal deaths for every 1,000 live births. An infant mortality rate is highly sensitive to changes in the number of births within a community, and it may not be surprising to have an increase in the number of infant deaths if there is also an increase

in the number of overall babies being born.

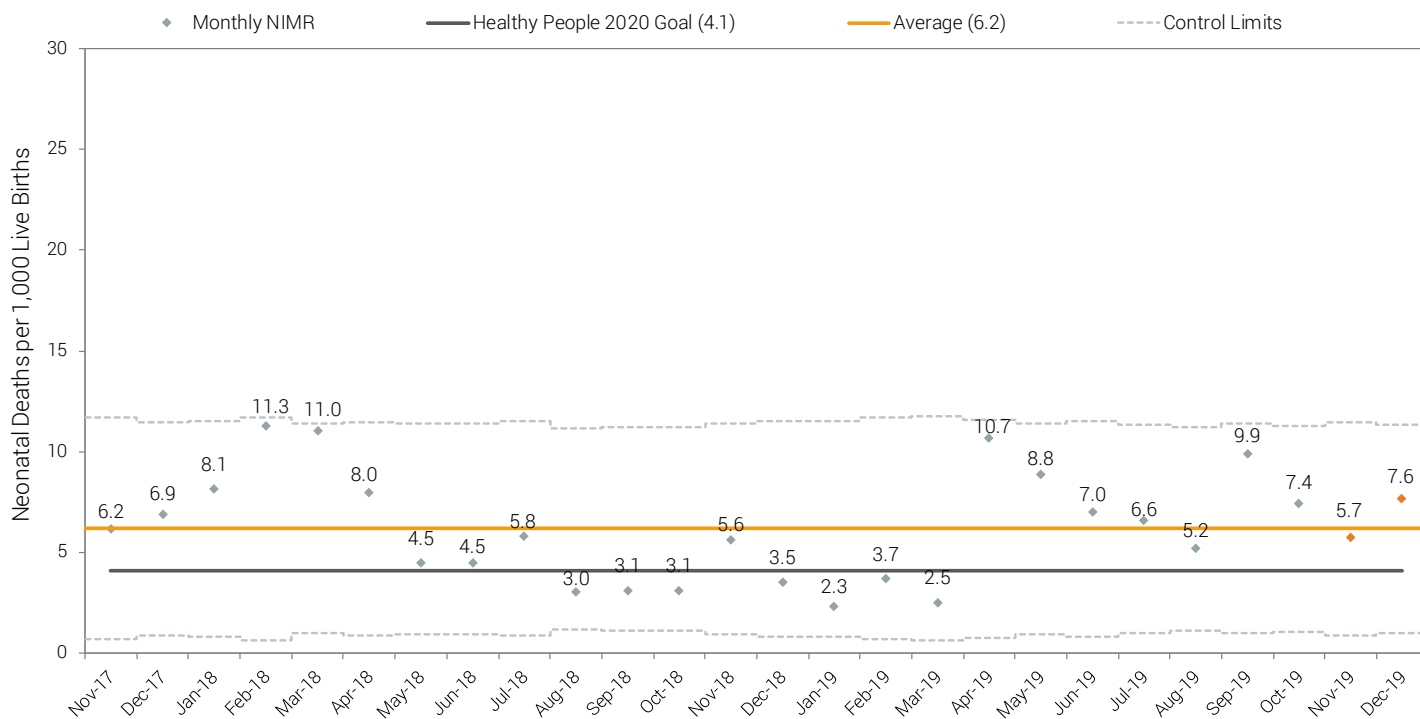
The IMR for December 2019 was 7.6 infant deaths per 1,000 live births (Figure 1). The December IMR is higher than the Healthy People 2020 goal of 6.0 infant deaths per 1,000 live births as shown in Figure 1. The December 2019 NIMR was 7.6 neonatal deaths per 1,000 live births (Figure 2). The December NIMR was higher than the Healthy People 2020 goal of 4.1 neonatal deaths per 1,000 live births. Neonatal deaths make up 70% of infant deaths in Hamilton County from January 2018 - December 2019. As can be seen from comparing Hamilton County rates and national infant health goals, Hamilton County is experiencing problems within the community regarding maternal and infant health.

Figure 1. Infant Mortality Rate Surveillance Chart, Hamilton County, Nov 2017 - Dec 2019\*



NOTE: The mean is calculated using two years of data from Nov 2017 - Oct 2019. Orange points are more likely to change in future reports.  
 \*Data for 2019 is provisional; ODH reconciles (i.e. finalizes) data by fall of the subsequent year.  
 Data Source: ODH Vital Statistics

Figure 2. Neonatal Mortality Rate Surveillance Chart, Hamilton County, Nov 2017 - Dec 2019\*



NOTE: The mean is calculated using two years of data from Nov 2017 - Oct 2019. Orange points are more likely to change in future reports.  
 \*Data for 2019 is provisional; ODH reconciles (i.e. finalizes) data by fall of the subsequent year.  
 Data Source: ODH Vital Statistics

# PRETERM, VERY PRETERM, & <23 WEEKS GESTATION BIRTH RATES

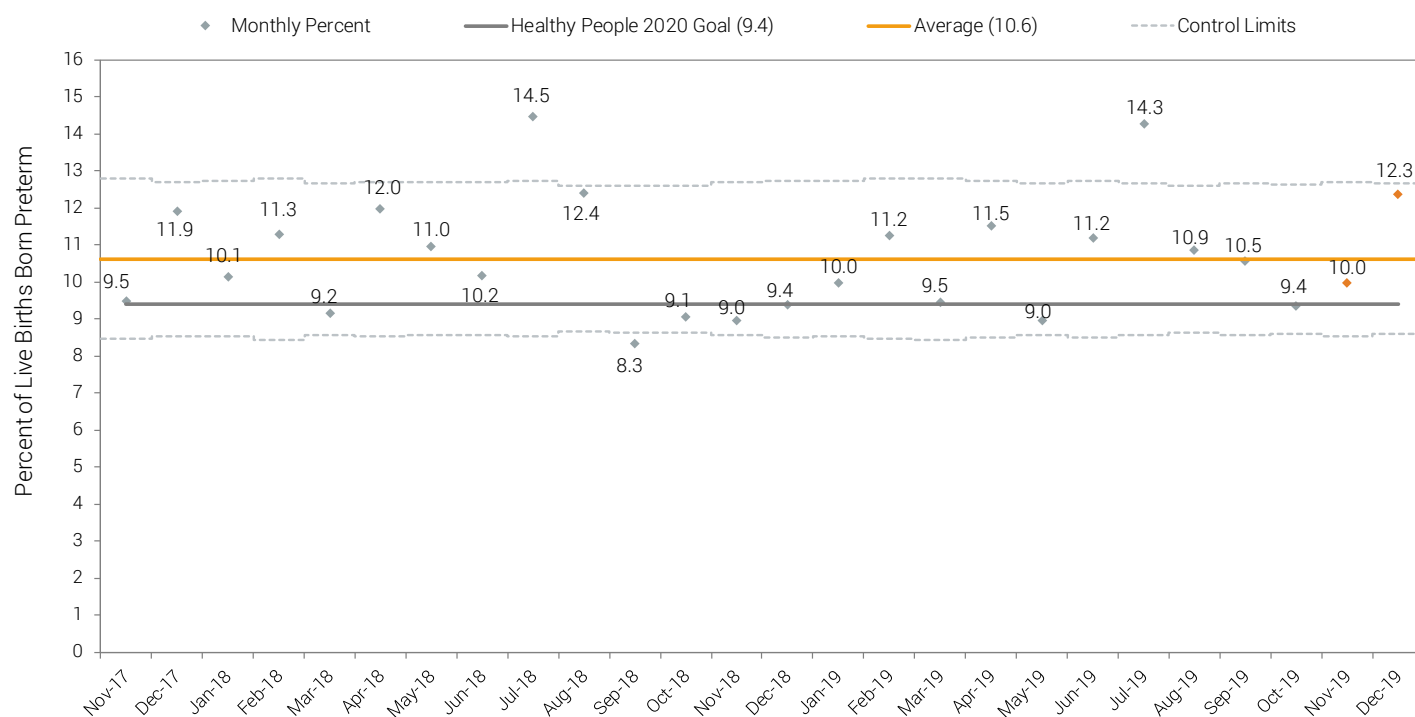
A preterm birth is the birth of a baby that happens more than three weeks before the baby is due. A preterm birth rate is the percent of babies who are born before the start of the 37<sup>th</sup> week of pregnancy. The very preterm birth rate is the percent of babies who are born before the start of the 32<sup>nd</sup> week of pregnancy. The <23 weeks gestation birth rate is the percent of babies who are born before the start of the 23<sup>rd</sup> week of pregnancy. The <23 weeks gestation birth rate is important to track as approximately 1/3 of all infant deaths in Hamilton County each year are from babies who are born before the start of the 23<sup>rd</sup> week of pregnancy. Preterm birth increases the chance for infant death and many other poor health outcomes.

The preterm birth rate for December 2019 (12.3%) is higher than the average preterm birth rate in Hamilton County (10.6%). The very preterm birth rate for December 2019 (2.9%) was higher than the Hamilton County average (1.9%). The <23 weeks gestation birth rate for December 2019 is 0.46%, which is higher than the Hamilton County average (0.26%).

12.3%  
December 2019  
Preterm Birth Rate

2.9%  
December 2019  
Very Preterm  
Birth Rate

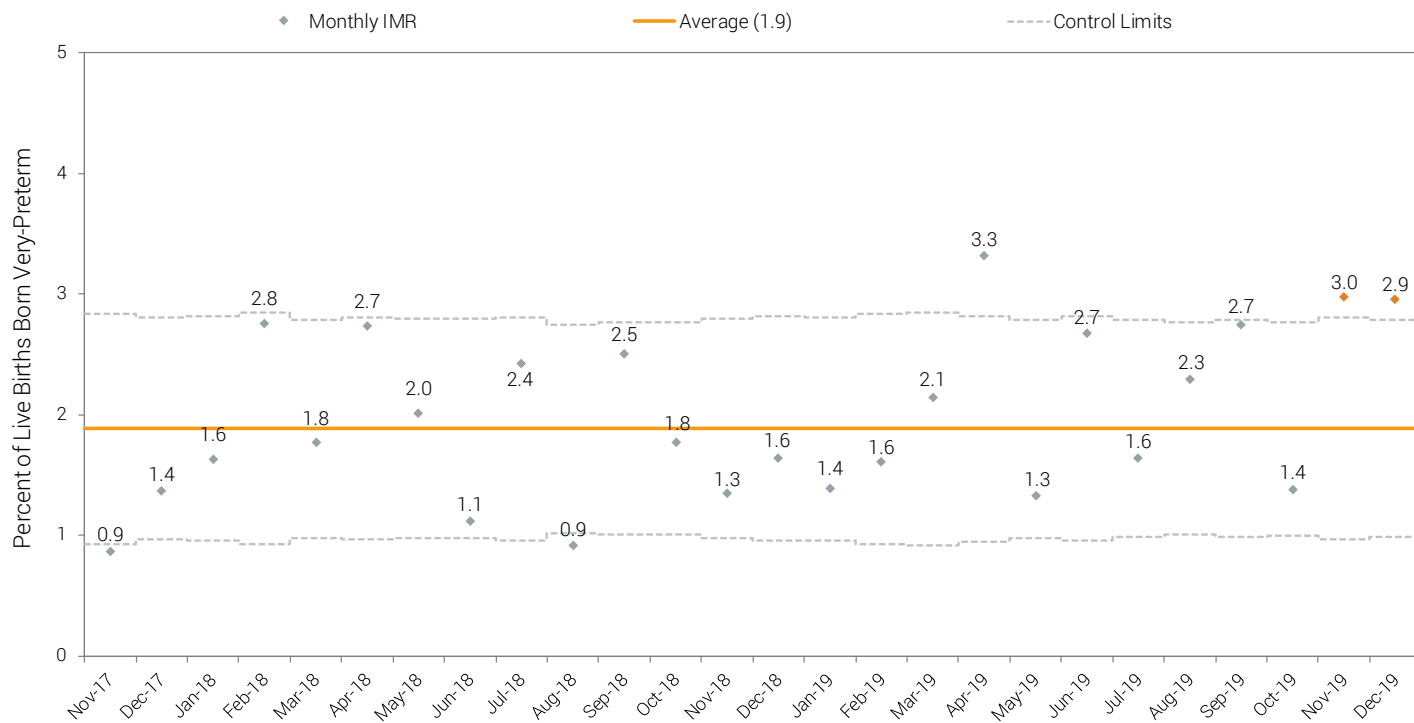
Figure 3. Preterm Birth Rate Surveillance Chart, Hamilton County, Nov 2017 - Dec 2019\*



NOTE: The mean is calculated using two years of data from Nov 2017 - Oct 2019. Orange points are more likely to change in future reports.  
\*Data for 2018 & 2019 are provisional; ODH reconciles (i.e. finalizes) data by fall of the subsequent year.

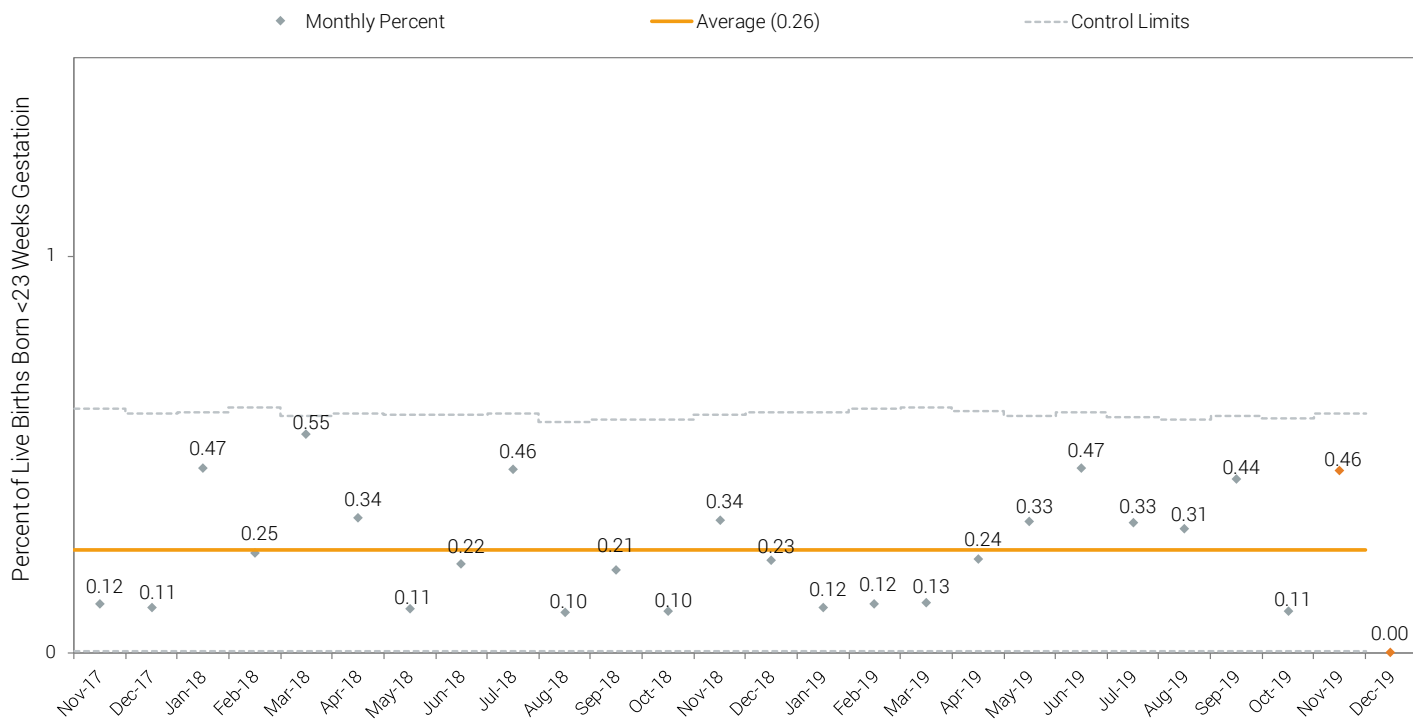
Data Source: ODH Vital Statistics

Figure 4. Very Preterm Birth Rate Surveillance Chart, Hamilton County, Nov 2017 - Dec 2019\*



NOTE: The mean is calculated using two years of data from Nov 2017 - Oct 2019. Orange points are more likely to change in future reports.  
 \*Data for 2019 is provisional; ODH reconciles (i.e. finalizes) data by fall of the subsequent year.  
 Data Source: ODH Vital Statistics

Figure 5. <23 Weeks Gestation Birth Rate Surveillance Chart, Hamilton County, Nov 2017 - Dec 2019\*



NOTE: The mean is calculated using two years of data from Nov 2017 - Oct 2019. Orange points are more likely to change in future reports.  
 \*Data for 2019 is provisional; ODH reconciles (i.e. finalizes) data by fall of the subsequent year.  
 Data Source: ODH Vital Statistics

# SMALL FOR GESTATIONAL AGE BIRTH RATE

Small for gestational age (SGA) birth rate is the percent of births where only one baby was born whose weight at birth is at or below a set value (10<sup>th</sup> percentile) for the week of pregnancy they were born at<sup>2</sup>. SGA compares the birth weight of an infant to a national distribution of live births so the weights are specific to infants of the same gestational age. The value for the 10th percentile of birth weight was adopted from the live births for 1990 in the United States<sup>3</sup>. The health of the mother and social factors prior to pregnancy can influence if a child is born small for their gestational age<sup>2</sup>. SGA can have an impact on the health of the infant throughout childhood and into adulthood<sup>2</sup>. Babies who are born small for their gestational age have an increased risk for infant death and illness, permanent lack in growth, reduction or impairment of cognitive function, and the development of adult chronic disease<sup>2</sup>. The SGA birth rate in December 2019 is 13.3%, which is higher than the average SGA birth rate in Hamilton County (11.3%).

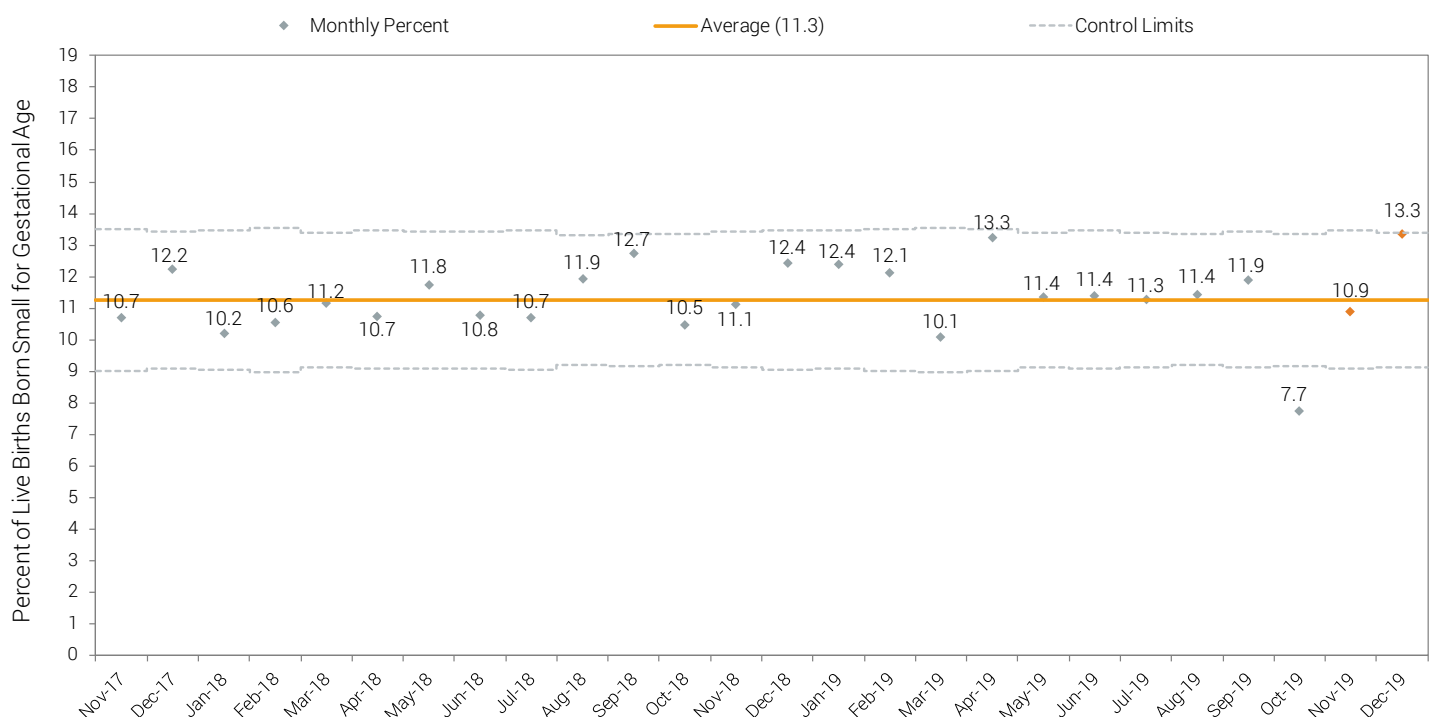
13.3%  
December 2019  
SGA Birth Rate

2. Association of Maternal & Child Health Programs. *Life Course Indicator: Small for Gestational Age*, 2014.

3. Oken E, Kleinman KP, Rich-Edwards J, Gillman MW. *A nearly continuous measure of birth weight for gestational age using a United States reference*. BMC Pediatric. 2003; 3:6. doi: 10.1186/1471-2431-3-6.

NOTE: SGA Percent illustrated in Figure 6 is calculated using gender-specific small for gestational age 10<sup>th</sup> percentile cut-off for more accurate measures

Figure 6. Small for Gestational Age Rate Surveillance Chart, Hamilton County, Nov 2017 - Dec 2019\*



NOTE: The mean is calculated using two years of data from Nov 2017 - Oct 2019. Orange points are more likely to change in future reports.

\*Data for 2019 is provisional; ODH reconciles (i.e. finalizes) data by fall of the subsequent year.

Data Source: ODH Vital Statistics

# PREGNANCY SPACING

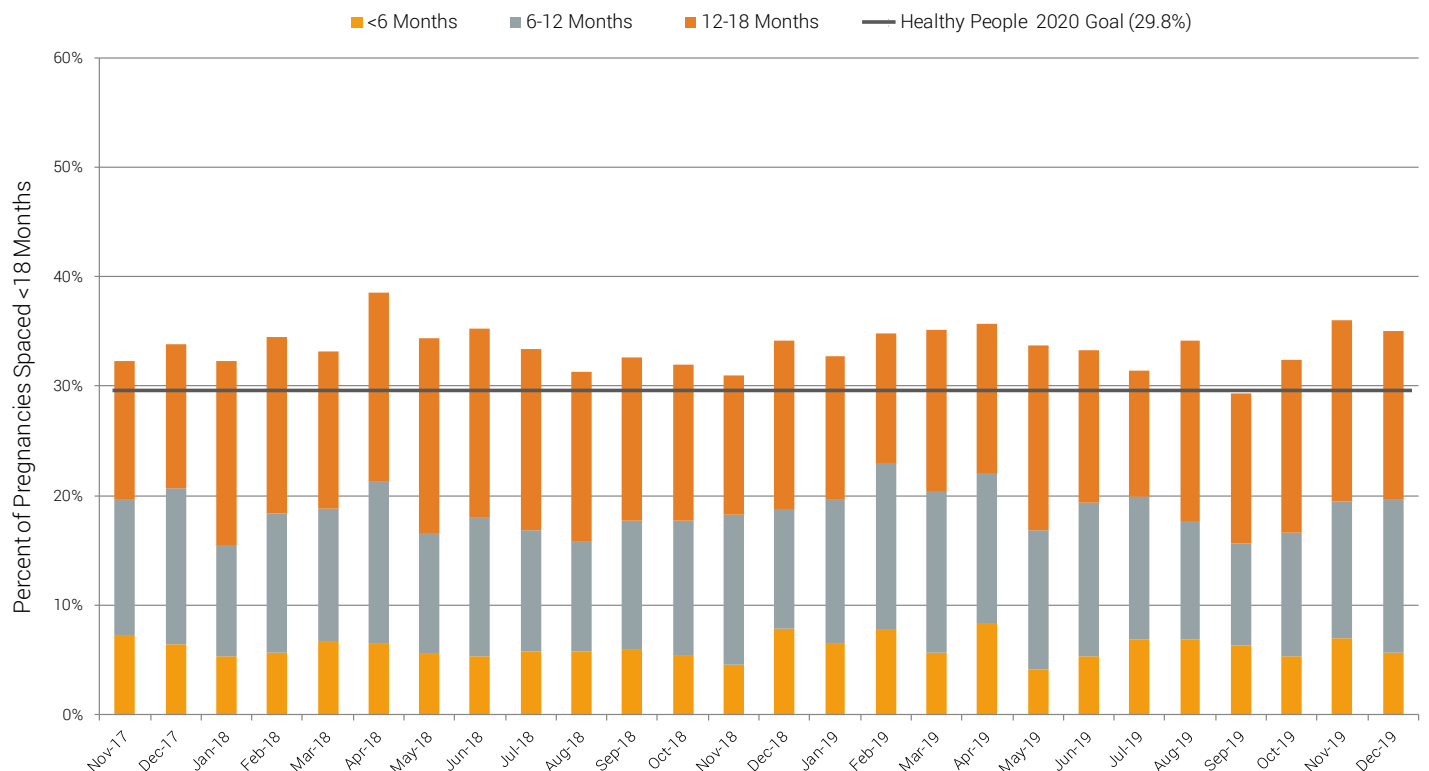
Pregnancy spacing is the number of months between the live birth of a previous child and the conception of the next pregnancy. It has been shown that short spacing between pregnancies, less than 18 months from the previous live birth to conception of the next pregnancy, can lead to harmful outcomes for both mothers and newborns. Mothers with short pregnancy spacing have an increased risk for developing pre-eclampsia (a condition that can cause blood pressure to rise and put mothers at risk for health issues including death), while the infant is more likely to be born prematurely. Pregnancies spaced between 18 and 59 months are considered optimal pregnancy spacing, as recommended by the World Health Organization<sup>4</sup>. Optimal spacing can lead to better outcomes for both the mother and the infant. However, for women of older ages, short pregnancy spacing may be part of the intended family building; in these cases women should talk with their doctor to weigh the health benefits of longer spacing between pregnancies and the health risks of short spacing between pregnancies.

The percentage of pregnancies in Hamilton County that were spaced less than 18 months for December 2019 is 37.1%; this percent is higher than the Healthy People 2020 goal of 29.8% of all pregnancies spaced less than 18 months. Of the pregnancies spaced less than 18 months between November 2017 and December 2019, 44.6% of pregnancies were spaced between 12 and 18 months.

By educating mothers about the importance of properly spacing pregnancies, the risk for poor health complications for both mother and infant could be reduced.

4. World Health Organization. *Report of a WHO Technical Consultation on Birth Spacing*, 2006

Figure 7. Percent of Pregnancies Spaced <18 Months, Hamilton County, Nov 2017 - Dec 2019\*



NOTE: \*Data for 2019 is provisional; ODH reconciles (i.e. finalizes) data by fall of the subsequent year.

‡ Percentage of short spaced pregnancies does not include first time mothers or pregnancies where information pertaining to previous live birth was missing/unknown

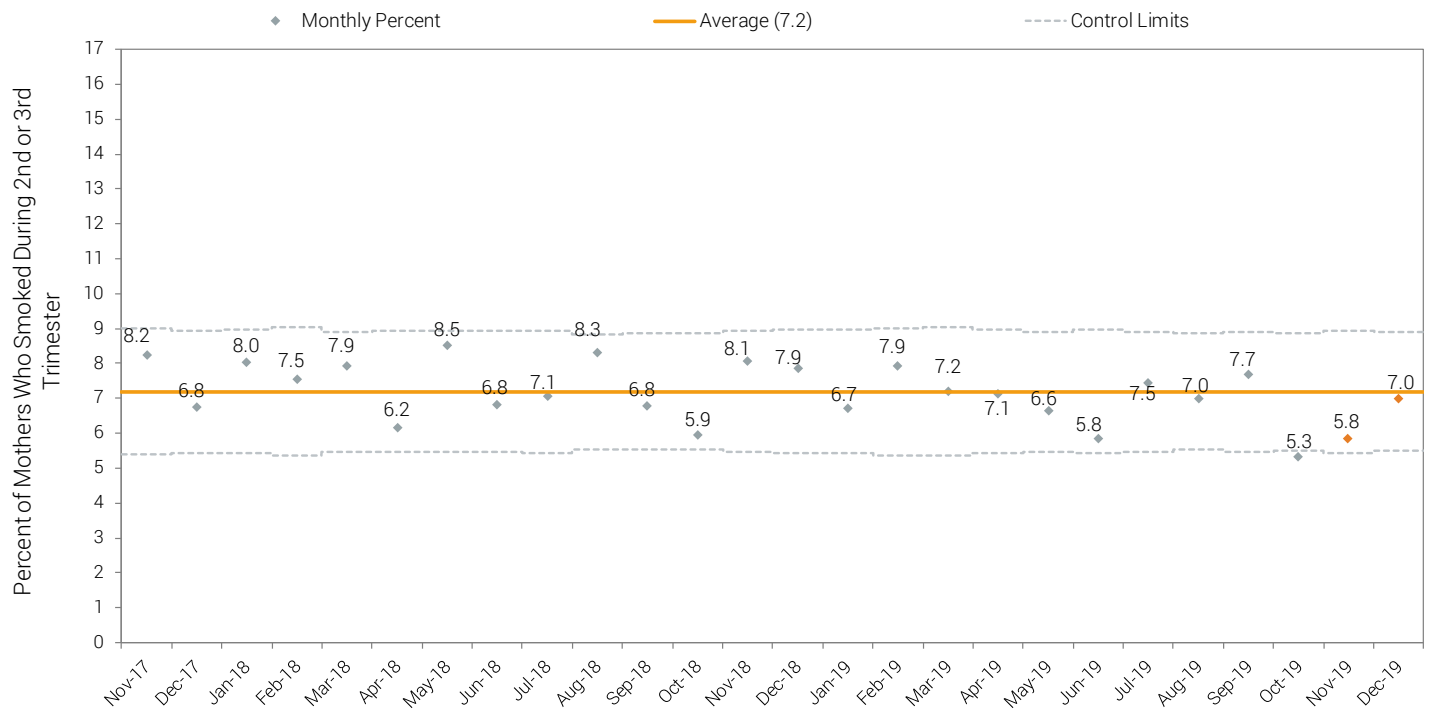
Data Source: ODH Vital Statistics



# MATERNAL SMOKING RATE

Smoking, tobacco use, and other forms of substance use and abuse during pregnancy can be extremely harmful to a developing baby. Women who smoked during pregnancy in Hamilton County were 44% more likely to experience an infant death. The percentage of births in Hamilton County where the mother smoked in the 2nd or 3rd trimester (the last 6 months of pregnancy) for December 2019 was 7.0% (Figure 8). This was slightly lower than the average number of births to women who reported smoking in the 2nd or 3rd trimester for Hamilton County (7.2%)

Figure 8. Maternal Smoking Rate Surveillance Chart, Hamilton County, Nov 2017 - Dec 2019\*



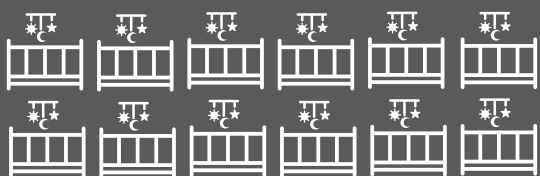
NOTE: The mean is calculated using two years of data from Nov 2017 - Oct 2019. Orange points are more likely to change in future reports.  
\*Data for 2019 is provisional; ODH reconciles (i.e. finalizes) data by fall of the subsequent year.  
Data Source: ODH Vital Statistics




# SLEEP-RELATED DEATHS

A sleep-related death is the death of an infant due to unsafe sleeping environments. A safe sleeping environment is one in which the infant is sleeping alone, on their back, and in a crib. Unsafe sleeping environments can consist of co-sleeping (a parent, adult or older child sharing a bed with an infant), an infant sleeping on a couch, an infant sleeping in a crib filled with blankets or pillows, or an infant being put to sleep on his/her stomach. There have been 12 sleep-related deaths in Hamilton County in 2019 so far. However, as further iterations of the report are published, the number of sleep-related deaths may change as records become finalized and complete.

## Sleep-Related Deaths in Hamilton County, 2019 Year-to-Date



 = 1 sleep-related death

ALWAYS FOLLOW THE ABC'S OF SAFE SLEEP, EVEN DURING NAP TIME.



**A**lone **B**ack **C**rib

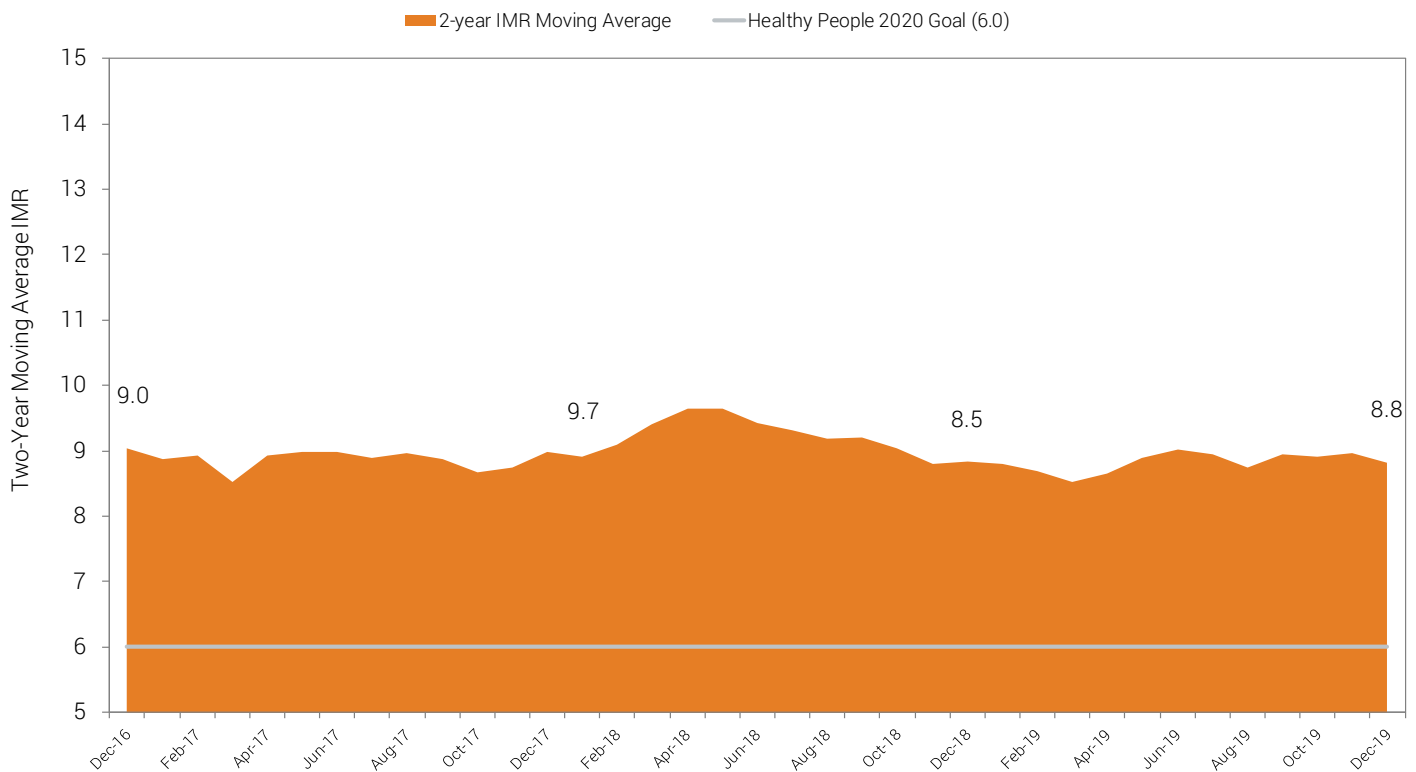
Baby sleeps safest alone, on their back, in a crib.



# TWO-YEAR MOVING AVERAGE

Reviewing monthly rates is one approach used to determine whether there has been a change over time in infant deaths. However, monthly rates have a tendency to fluctuate and may hide emerging trends. An alternative measure is the un-weighted, monthly moving average, which can provide a more stable picture of evolving patterns. In Figure 10, the infant mortality rate for each month is the 24-month average of months immediately prior to and including the current month. The two-year moving average is lower from December 2016 (9.0) to December 2019 (8.8) as shown in Figure 10. Please note that the two-year moving average is subject to change based on new data, which may ultimately affect current trends. Multiple approaches are required to measure the impact of efforts to reduce infant mortality.

Figure 10. Two-Year Moving Average Infant Mortality Rate by Month, Hamilton County, Dec 2016 - Dec 2019\*



NOTE: The infant mortality rate for each month is the average of the 24 months immediately prior to and including the last month.

\*Data for 2019 is provisional; ODH reconciles (i.e. finalizes) data by fall of the subsequent year.

Data Source: ODH Vital Statistics



# APPENDIX A

## GENERAL GUIDELINES FOR USING SURVEILLANCE CHARTS

The Hamilton County Infant Mortality Surveillance System (HCIMSS) uses surveillance charts to monitor infant mortality rates, preterm birth rates, and other birth outcomes. These charts provide a method for monitoring the status of infant health over time and provide timely feedback on the effectiveness of local efforts to reduce infant deaths.

Several tools are included in the surveillance charts that help facilitate interpretation:

1. A baseline - the center line which is the average number of deaths per month over the preceding two years,
2. A goal line which shows the goal that has been established by the community,
3. Upper and lower control limits (dashed) that allow user to detect unusual events.

Annotations indicate when certain interventions began or special changes occurred.

Here are some types of unexpected events that could be detected within surveillance charts:

- A single point outside of the control limit
- A run of eight or more consecutive points below or above the center line
- Six consecutive decreasing or increasing points
- Two out of three consecutive points near a control limit.

*This report was prepared by Hamilton County Public Health, Department of Community Health Services, Division of Epidemiology and Assessment in collaboration with Cradle Cincinnati.*



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